

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference GHS/P503618WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/00939	International filing date (<i>day/month/year</i>) 06.03.2003	Priority date (<i>day/month/year</i>) 06.03.2002
International Patent Classification (IPC) or both national classification and IPC B65D39/00		
Applicant BACCHUS WINE CLOSURES LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 29.09.2003	Date of completion of this report 07.07.2004
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized Officer Janosch, J Telephone No. +49 89 2399-7525



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/00939**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-13 as originally filed

Claims, Numbers

1-41 received on 11.06.2004 with letter of 08.06.2004

Drawings, Sheets

1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☒ the claims, Nos.: 42,43
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☒ not complied with for the following reasons:

see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.
☒ the parts relating to claims Nos. 1-38 .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-38
	No: Claims	
Inventive step (IS)	Yes: Claims	1-38
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-38
	No: Claims	

2. Citations and explanations

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/00939**

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item IV

Lack of unity of invention

1. The International Preliminary Examination Authority found separate inventions/groups of invention in this application. These inventions are:

I. Invention 1: Claims 1-38:

A stopper with a barrier layer comprising a reactive hot melt polyurethane adhesive.

II. Invention 2: Claim 39:

A method of applying a barrier layer to a stopper by forming a pre-polymer by combining an isocyanate solution with a polyol solution, applying it to the stopper and allowing the pre-polymer to cure.

III. Invention 3: Claims 40 and 41:

A method of applying a barrier layer to a stopper comprising applying reactive hot melt adhesive to one of a stopper and a partially formed barrier layer, allowing the hot melt adhesive to cool and contacting the stopper and the barrier layer such that bonding occurs.

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

The only feature common to independent claims 1, 39 and 40 is a barrier layer applied to a stopper. This feature is known from the prior art, as disclosed by documents EP-A-1 270 703, WO-A-00/64647 or DE-A-39 40 461. The requisite unity of invention (Rule 13.1 PCT) therefore no longer exists inasmuch as a technical relationship involving one or more of the same or corresponding special technical features in the sense of Rule 13.2 PCT does not exist between the subject-matter of the above mentioned groups of claims. Further, since the inventions 1-3 address different technical problems (invention 1: the provision of a thin film with limited oxygen permeability; invention 2: the provision of a pre-polymer; invention 3: Adhering a barrier layer) the inventions 1-3 cannot involve corresponding special technical features in the meaning of Rule 13.2 PCT and the inventions 1-3 lack unity in accordance with Rule 13.1 PCT.

2. The applicant was invited to restrict his application to one of the inventions mentioned above or alternatively to pay two additional examination fees. In the absence of any response the Examination Authority examined the invention defined by present claims 1-38.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

D1: WO 00/64647 A (VINPAC INTERNAT PTY LTD ;MA ROSALIND (AU);
WILKS TERRY (AU); BRITC) 2 November 2000 (2000-11-02) and
D2: DE 42 25 092 A (KESSLER REINHARD) 4 February 1993 (1993-02-04).

- 2.1 Document **D1**, which is considered to represent the most relevant state of the art for the subject-matter of claim 1, discloses (cf. page 2, last paragraph; page 9, lines 1-19) a stopper comprising a barrier layer which comprises polyurethane from which the subject-matter of claim 1 differs in that the polyurethane has the form of a reactive hot melt adhesive.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to avoid a further adhesive layer.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) since the cited prior art does not provide any hint to take a reactive hot melt polyurethane adhesive as barrier layer. Providing the polyurethane as reactive hot melt adhesive between two parts of the stopper has two advantages: it is not necessary to provide an additional adhesive and the barrier layer is protected between the two parts of the stopper.

- 2.2 Claims 2-27 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

- 2.3 Document **D2**, which is considered to represent the most relevant state of the art for the subject-matter of claim 28, discloses (cf. column 2, lines 19-51) a composite barrier layer from which the subject-matter of claim 28 differs in that the layer comprises a reactive polyurethane sub-layer.

The subject-matter of claim 28 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to provide an alternative adhesive.

The solution to this problem proposed in claim 28 of the present application is considered as involving an inventive step (Article 33(3) PCT) since the prior art does not provide any hint to provide a reactive polyurethane sub-layer.

- 2.4 Claims 29-38 are dependent on claim 28 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VIII

Certain observations on the international application

1. Independent claims 1 and 28 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1 or D2) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT), as indicated in Item V 2.1 and 2.3 above.

CLAIMS

10/506843
DT04 Rec'd PCT/PTO 03 SEP 2004

1. A stopper comprising a barrier layer which comprises a reactive hot melt polyurethane adhesive.
2. A stopper according to Claim 1 wherein the barrier layer has a permeability of less than about $200 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$.
3. A stopper according to Claim 1 wherein the barrier layer has a permeability of less than about $50 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$.
4. A stopper according to Claim 1 wherein the barrier layer has a permeability of less than about $30 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$.
5. A stopper according to Claim 1 wherein the barrier layer has a permeability of $0 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$.
6. A stopper according to any one of Claims 1 to 5 wherein the barrier layer has a thickness of from about 0.05 to about 100 microns.
7. A stopper according to any one of Claims 1 to 5, wherein the barrier layer has a thickness of from about 0.075 to about 50 microns.
8. A stopper according to any one of Claims 1 to 5, wherein the barrier layer has a thickness of from about 0.1 to about 30 microns.
9. A stopper according to any one of Claims 1 to 8 wherein the polyurethane adhesive is an aliphatic polyurethane.
10. A stopper according to any one of Claims 1 to 9 wherein the barrier layer includes one or more additives.
11. A stopper according to Claim 10 wherein the or each additive is selected from metal oxides finely divided silicon, powdered PTFE and clays.

12. A stopper according to any one of Claims 1 to 11 wherein the stopper is cylindrical in shape and has two faces located at the ends of the cylinder.
13. A stopper according to any one of Claims 1 to 12 wherein the stopper is shaped to resemble a champagne cork and has a face located at the base of the stopper.
14. A stopper according to Claim 12 or 13 wherein the at least one face is rounded or bevelled.
15. A stopper according to Claim 12 or 14 wherein the barrier layer is located at either or both of the faces.
16. A stopper according to any one of Claims 12 to 14 wherein the barrier layer is located within the body of the stopper and substantially parallel to the or at least one of the faces of the stopper.
17. A stopper according to any one of Claims 1 to 16 wherein the barrier layer extends across the entire face or cross-section of the stopper such that a continuous barrier is provided.
18. A stopper according to any one of Claims 1 to 17 wherein the barrier layer extends across only a portion of the face or cross-section.
19. A stopper according to any one of Claims 1 to 18 wherein the barrier layer extends beyond the face or cross-section of the stopper to form a gasket.
20. A stopper according to any one of Claims 1 to 19 wherein the barrier layer is a composite layer comprising at least one hot melt polyurethane adhesive sub-layer and at least one sub-layer having lower oxygen permeability than the hot melt adhesive.

21. A stopper according to Claim 20 wherein a hot melt polyurethane adhesive sub-layer is located against the material of the stopper.
22. A stopper according to Claim 20 or 21 wherein the lower oxygen permeability material is a metal foil or a vacuum deposited metal.
23. A stopper according to Claim 20 or 22 wherein the lower oxygen permeability material is an ethylene vinyl alcohol copolymer.
24. A stopper according to any one of Claims 1 to 22 wherein the stopper is a stopper for a bottle.
25. A stopper according to Claim 24 wherein the bottle is a wine bottle.
26. A stopper according to Claim 24 or 25 wherein the stopper is made of cork or plastics material.
27. A stopper according to any one of Claims 1 to 26 wherein the barrier will additionally provide a barrier to microbiological contaminants.
28. A composite barrier layer for use with a stopper comprising at least one reactive hot melt polyurethane adhesive sub-layer and at least one sub-layer having lower oxygen permeability than the or each hot melt adhesive sub-layer.
29. A barrier layer according to Claim 28 wherein the lower oxygen permeability material is a metal foil or a vacuum deposited metal.
30. A barrier layer according to Claim 28 wherein the lower oxygen permeability material is an ethylene vinyl alcohol copolymer.
31. A barrier layer according to any one of Claims 28 to 30 having a permeability of less than about $200 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$.

32. A barrier layer according to any one of Claims 28 to 31 having a permeability of less than about $50 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$.
33. A barrier layer according to any one of Claims 28 to 32 having a permeability of less than about $30 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$.
34. A barrier layer according to any one of Claims 28 to 32 having a permeability of $0 \text{ cm}^3 \text{ m}^{-2} \text{ day}^{-1}$.
35. A barrier layer according to any one of Claims 28 to 34 having a thickness of from about 0.05 to about 100 microns.
36. A barrier layer according to any one of Claims 28 to 34 having a thickness of from about 0.075 to about 50 microns.
37. A barrier layer according to any one of Claims 28 to 34 having a thickness of from about 0.1 to about 30 microns.
38. A barrier layer according to any one of Claims 28 to 37 comprising in order: a sub-layer of a polyolefin, a sub-layer of an ethylene vinyl alcohol copolymer and a further sub-layer of a polyolefin.
39. A method of applying a barrier layer comprising: forming a pre-polymer by combining an isocyanate solution with a polyol solution; applying the pre-polymer to a surface of the stopper; and allowing the pre-polymer to cure.
40. A method of applying a barrier layer to a stopper comprising applying reactive hot melt adhesive to one of a stopper and a partially formed barrier layer; allowing the hot melt adhesive to cool; and contacting the stopper and the barrier layer such that bonding occurs.
41. A method according to Claim 40 wherein the barrier layer having been applied to the stopper is held in tension and the stopper is pushed into a cup.

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